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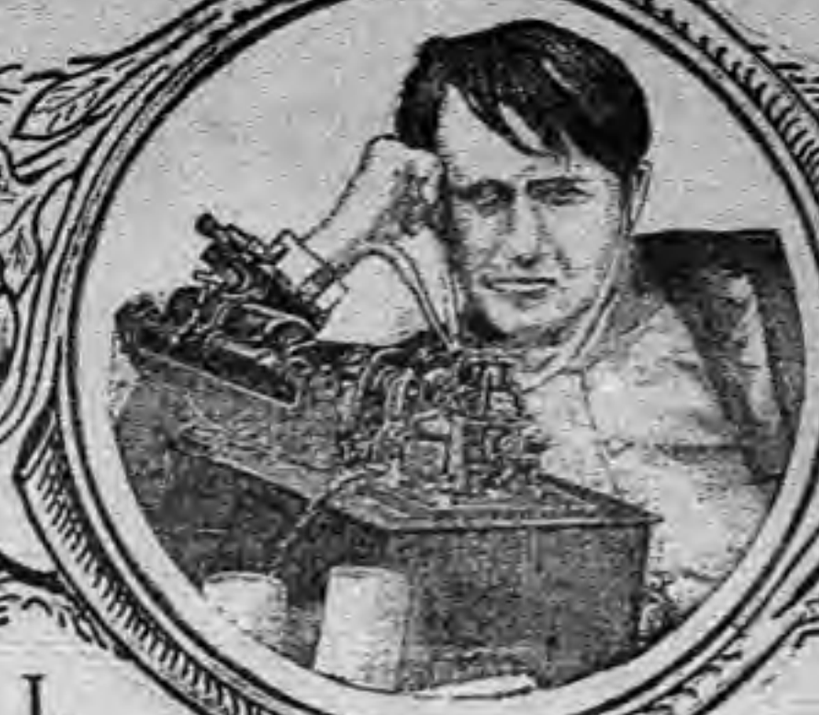

Vol. I. No. 2.

LOUISIANA PHONOGRAPH CO.,
26 & 27 Equitable Building,
NEW ORLEANS, LA.

# PHONOGRAM

A MONTHLY MAGAZINE

DEVOTED TO

THE SCIENCE OF SOUND

AND

RECORDING OF SPEECH.

PUBLISHED BY
THE NATIONAL PHONOGRAPH PUB. CO., L'D.
WORLD BUILDING, NEW YORK.



Entered at the New York Post-Office as Second-class Matter.

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# THE PHONOGRAM

VOL. I.] ◁ FEBRUARY, 1891. ▷ [NO. 2.

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| Missouri " | " St. Louis, Mo | Missouri, Arkansas, and Indian Ter. |
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| Nebraska " | " Omaha, Neb | Eastern part of State of Nebraska. |
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| Ohio " | " Cincinnati, Ohio | Ohio. |
| Old Dominion " | " Roanoke, Va | Virginia, North and South Carolina. |
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| South Dakota " | " Sioux Falls, So. Dak | South Dakota. |
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| Tennessee " | " Nashville, Tenn | Tennessee. |
| West. Penn. " | " Pittsburgh, Penn | West. part State Pa. and W. Virginia. |
| Wisconsin " | " Milwaukee, Wis | Wisconsin. |
| West Coast " | " Portland, Ore | Oregon, West of 44° long. / Washing'n, " " 44° " |
| Wyoming " | " Cheyenne, Wy. Ter | Wyoming. |


A MAGAZINE devoted to all interests connected with the recording of sound, the reproduction and preservation of speech, the Telephone, the Typewriter, and the progress of Electricity.

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## The Real Mission of the Phonograph.

WE believe that we can utter no truer words of counsel to the many phonograph companies now in the United States, than when we urge them to make the genuine and legitimate use of the phonograph paramount to all of its attractive qualities as a mere coin-in-the-slot device for the temporary admiration of the multitude.

To a certain degree, the advertisement which the instrument has derived by reason of its exhibition in public places, has proved advantageous and even profitable, but the gain is by no means commensurate with that which will accrue when the phonograph is adopted in the counting-rooms, offices and libraries of the merchants and professional men of the country, and is regarded as something more than the toy and plaything of women and children.

The real mission of the phonograph is that of a helper. Its life and greatness among the labor-saving mechanisms of the world will depend on this fact. It is a humanized bunch of iron nerves and sinews that has come among us to relieve the world more or less of mental strain; to bring the world's workers in closer contact with the means of multiplying their power, saving time, and preserving that which, without it, would escape all record; to give to men, women and children alike the inestimable privilege of hearing repeated the "thoughts that breathe and words that burn."

To the capitalist, merchant or public man whose desire it is to preserve his secrets from publicity, the phonograph is his confidential secretary. It requires no human intermediary, whose fearless gossip may be bought or sold, to interpret what its intelligent ear has heard; its confidence is reserved for the master and his friend. In the silence of his study the minister may whisper the themes of his morrow's sermon; the lawyer prepare his brief; in the sick-room the invalid may dictate his last will and wishes, and feel that the tones of his voice will be a sweet heritage to those he may leave behind; to the reporter, whose business it is to transcribe the speeches of the orator, it is a boon for which there is no equivalent. It was printed only the other day, that the marvelous debates in Congress, covering as they sometimes do from twelve to twenty hours, can only be reproduced in the next ensuing Congressional Record through the agency of the phonograph.

Yet in the face of all this combination of valuable use, this ability to lessen the labor of men and women, our little iron confidante and friend, that we may awaken in the night and talk and listen to as if it were another self, is disparaged and humiliated by being placed side by side with the nickel-in-the-slot weighing machines, and

every other speculative attraction of a circus show or a bar room, in order that it may turn an honest penny.

We repeat, therefore, that the companies which have been organized throughout the United States are doing themselves injustice when they limit their operations to the introduction of the phonograph in places where its novelty will quickly disappear and its profits cease to count.

We are aware this vein of reflection will arouse the enmity of small men. Indeed, a mere hint in the direction we are aiming, which appeared in the last number of THE PHONOGRAM, provoked James L. Andem, the President and General Manager of the Ohio Phonograph Company, to write to us: "We do not care to subscribe to and pay for a magazine which promulgates views the exact opposite of those we entertain in regard to our own business, and to aid in circulating such a magazine;" but we wish to say to Mr. Andem, and all others like him, that men who cannot stand honest argument without flinching, and who show the weakness of their intellectual fibre by refusing support to a magazine which they cannot see is practically their own weapon of defense and offense, do not fitly represent the mighty power that is latent in the phonograph and awaiting the development at the hands of real men whose brains are above five cents' worth of cheap music doled out in gin shops by this much-disparaged and misunderstood instrument.

It is the mission of this magazine to teach the masses the great things which the phonograph is intended to accomplish. The pleasure it affords is one thing. Its work as a labor-saver is another. THE PHONOGRAM plants its standard in the broad road that leads to the grander results.

V. H. MCRAE.

## The King of Phonographs.

THE nineteenth century, having arrogated to itself the right to peer into the arcana of nature, study her secret elements and force them to submit to her will, has asserted and maintained an individuality far exceeding that of her sister centuries.

This is the century of grand inventions. And what a record it shows! From steam to electricity, light, sound, explosive agents—each force thoroughly exploited and subdued. The latest comet on the horizon of this wonderful system is the new phonograph. Not content with enacting the role of a recorder, a repeater of sonorous oratorical periods, dry law or tedious statistics, entering boldly the domain of the nymph Echo and imitating all her pretty reverberations; conveying to you in solemn tones the last words of the dying; soothing your ear with the melodies of skilled vocalists or the combined strains of a full orchestra, one would suppose that it had usurped functions sufficient to entitle it to the well-earned title of King of machines. Yet it still goes on conquering and to conquer. Its last arena is the court-room and the halls of legislative assemblies. In the first, it unerringly reflects the contradictory statements of the perjured witness and the double-dealing lawyer: this fact will come to be known in time by the *'coi polloi* of every class, and they will be more guarded when the formidable detective stands near with eager, open ear to catch their utterances.

In the latter, its warning presence will constitute a salutary check to the unscrupulous statements of the partisan, the inane platitudes of the empty-headed politician, or the high-handed rulings of the newly fledged official leader.

The phonograph soon to be presented to the public is so contrived as to have its powers of catching and reconveying sounds "manifolded," if I may employ a technical term. It resembles, in the wonderful world of sound, one of those gigantic lenses used in modern telescopes which sweeps the heavens, and takes in objects hitherto undiscovered to the human eye, and lays bare the secrets of the starry system.

I see but one single function remaining to be filled by this magic instrument, which is, to seek the sunny South and let a mocking-bird pour into its capacious throat the whole marvelous repertoire of which he holds the keys. That will indeed be "something new under the sun."

IN the second issue of our magazine we are enabled to report to our readers a progress in the development of those qualities inherent in the phonograph, which bring it to a degree of perfection hitherto unconceived by the world; and a marked extension of scope and improvement in detail on the part of its coadjutor, THE PHONOGRAM.

Every wave of information sent out by the press to the civilized inhabitants of the globe carries back to its starting point a reflex wave of intelligence. This is, of course, not designed or preconcerted, but is clearly the effect of a natural law. Correspondents, patrons, friends, all become a medium of communication, and thus reciprocity is established. In this way THE PHONOGRAM performs a double duty for its public, and ascertains a fact of great interest to all connected with the

instrument or its representative; viz., that there are vast numbers of intelligent people in our country, wholly unacquainted with the uses and sphere of the phonograph, who are most desirous to acquire full information as to its capabilities.

This fact suggests a wide field of effort to all who wish to promote the success of the phonograph, and its organ, THE PHONOGRAM.

We therefore, as the pilot directing the course of the vessel, counsel those engaged in executing the movements necessary for its safe-conduct, to strain every nerve in order to sustain the publication which has evoked this important intelligence, as it is the resolute and unflagging oarsman that conducts the boat in triumph first to the goal.

## A PRACTICAL TEST.

THE following has just been received, and is such a strong endorsement of the position we have taken in our editorial, that we are glad of the opportunity to present it to our readers, as a practical exemplification of our own ideas on the subject. It is a letter from the proprietor of Stevenson's Phonographic Exchange, Chicago, Ill. He writes:

TO THE EDITOR OF THE PHONOGRAM:

*Dear Sir.*—The application of the phonograph to business uses is of such recent origin that any information in regard to its operation and the methods of applying it, can hardly fail to be of interest to the majority of your readers. That the phonograph is a thoroughly practical, useful business machine is beyond any question; but to a large extent it may be said that many of the methods of applying it are, as yet, theoretical and experimental, and of course liable to considerable change as the machine grows in public favor.

So far, the method which the writer has found most successful is what may be called the Contract System of Typewriting Service; that is, we make a contract to place at the service of customers a phonograph, and to furnish them with typewritten transcripts of their dictation to same, to a certain amount daily for a given sum per month, collecting and returning cylinders with transcripts as often as may be necessary to meet the requirements of individual cases.

During the greater part of 1890 I have given this method and the phonograph as thorough and complete a test as could well be desired by any one. My list of customers includes architects, editors, advertising agents, Board of Trade men, lecturers, reporters, surgical instrument and physicians' supply houses, etc., etc., and the following outline of a day's work may be taken as a fair sample of the daily test to which I have subjected the machine during that time:

The first lot of cylinders received are from the editor of a railway newspaper, and contain short editorials for the next issue of his paper. The first item deals with the construction of the first railway in Siam; the next, with the great activity in railway construction in Brazil; another, with the construction of an electric railway, for mail purposes only, between Buenos Ayres and Monte Video, across the La Platte River; then the construction of a railway along the Congo River in Central Africa, from Stanley Pool to Stanley Falls; and now the subject of railway sanitation and hygiene occupies the attention and ability of the operator; followed by an article on the financial situation.

The next lot of cylinders comes from an architect's office, and contains mason's and carpenter's specifications for the erection of a new 14-story building, introducing a great many technical terms which try the vocabulary of the operator to the utmost.

Another lot of cylinders comes from a surgical instrument and physicians' supply house, and contains general correspondence regarding orders for instruments and drugs

with dreadful Latin names, but they are disposed of by the operator in a manner that proves entirely satisfactory to the parties who dictated them.

Our next supply comes from an advertising agent, whose correspondence is somewhat easier to handle, although many strange words and phrases are used that one would hardly expect to find clinging to a simple "ad."

A civil engineer, whose letters are full of references to "single span," "double span" "bridges," "steel girders," "plates," "iron roofs," "stringers," "brackets," "I beams," etc., supplies the next lot of cylinders.

By this time we have got pretty well along in the afternoon, and our next "consignment of talk" comes from a Board of Trade firm. We are soon dancing about in the wheat and corn pits, now writing a bearish and anon a bullish letter.

From these prosaic subjects we turn with pleasure to attend to the correspondence of the secretary of a popular musical club, which closes the day's work, and we depart home feeling that we have added something to our store of knowledge and at the same time done a good day's work.

Having had over eight years' experience as a practical stenographer and typewriter, I feel competent to judge as to the merits of the phonograph as a stenographer. It is undoubtedly a wonderfully perfect machine, capable of doing all that its inventor claims for it, and destined to follow the typewriter into every business office. I confess that I am an enthusiast, but a practical enthusiast, as will be seen from the above recital, and nothing pleases me better than to be seated alongside my No. 2 typewriter with a good round voice to transcribe. The phonograph is a continual incentive to increased speed on the typewriter; great speed has already been developed on the Remington, but with the increasing use of the phonograph greater efficiency may be looked for from the average operator than is the case at the present time.

## Drilling by the Phonograph.

An interesting experiment was made at the Washington Light Infantry Armory several evenings ago, in the National Capital, after the conclusion of the lecture, to determine whether it is not feasible to use the phonograph in armories for the purpose of giving music to the companies while drilling. The experiment was tried by the representative of Edison's phonograph, who is confident that the music played into the phonograph by the Marine Band can be reproduced loud enough to be heard distinctly in the largest hall. General Ordway is much interested in the experiment, believing that it will be invaluable in teaching men the correct step and cadence.

The object of the experiment is an economical one only. It is impossible to use the band as often for the purpose of instruction as would be necessary to give the lessons all around, since the cost would be an extremely heavy one. Should the phonograph music suffice, each guardsman can have all the music marching drills he needs at a very small expense to the guard.

## The Phonograph Album.

A photograph of the human voice is much more valuable to the curious collector than a picture of the face, even when accompanied by an autograph. A favorite phase of the phonograph furore is the collection of specimens of recitations or singing from popular artists of the stage, and one gentleman of this city has secured cylinders representing vocally nearly every artist of any note who has been seen here for the last year. The collection is unique, because many of the records have no duplicate in existence, and the owner can give a six-hours' entertainment in his own house at any time, presenting the different artists, whose voices he has "bottled up," so to speak, in some of their most popular and successful roles.


## A FRANK CONFESSION.

BY JULIAN RALPH.

WHEN I was asked to contribute to the PHONOGRAM, I plagued myself with a cross-examination that lasted more than a week in an effort to hit upon a subject upon which to write. As writing is my profession, the experience is an uncommon one, yet at the end of the ordeal I was as barren of a suggestion as at the outset. In desperation I read the PHONOGRAM for inspiration. The little magazine surprised me. It gave to at least this one voracious reader of current literature more timely, serviceable, and intensely interesting information than any single number of any periodical I have read in many years.

The editor of the PHONOGRAM will read this without having had the slightest previous notion what my choice of a subject was to be, and therefore the general reader will understand that if what I set down here is high praise of this publication the commendation is general and sincere; indeed it is wrung from me against the protest of my judgment and habit. But the fact that impresses me is that if the founders of the PHONOGRAM followed the usual professional habit of starting a paper "to meet a demand," or "a long-felt want," they need have no fear as to the sagacity of their prompting. I had considered myself generally well-informed, but the first number of this monthly convinced me that I knew very little more about the subject to which it is devoted than a new-born kitten comprehends of the higher mathematics. I learned that the phonograph has been practically applied to manifold forms of every-day service to every-day men; that it is creeping close to myself in my own work-a-day life; that its uses interest the business man in the same degree that they affect those who follow a score of the professions, and that in the family circle, by the bedside of the sick and dying, on the plains and in the amusement halls it has assumed a place and value such as must give it rank among the wonders of the century we are closing and of the age whose threshold we are but passing. It was news to me that, in every forecast of the future, I must consider the part the phonograph is going to play, with a certainty that it will hold an important place in most phases of human action. Speech is the most unique gift to man, and its marvelous mimic, the phonograph, is adding to its usefulness and its importance in ways I had not dreamed of.

To descend from gravity for an instant, I must confess that what I have read of the wonders of the phonograph suggests to my mind a train of terrors that may spring from it. When the instrument is in as general use as the pen and ink are, fancy what may happen. Fancy the anguish of a hot-tempered man who, when he explodes with wrath over a torn buttonhole, or chides his wife for giving his oldest, and therefore his best-beloved, coat to the poor, is called into her boudoir to hear the family phonograph reel off the very language, the very voice he used when, in plighting his troth to her, he swore by Dan Cupid that he would never—or that he would forever—you understand. According to the PHONOGRAM, sweethearts will have these instruments by them, and they will treasure and use them as wives. Fancy, too, the state of mind of the wife of the future when her husband, after rejecting her pancakes with contemptuous language, hies him to his phonograph to read to her the recipe for buckwheat cakes which his dying mother spoke into the machine with her last breath.

But to be serious: If the PHONOGRAM gives one person in ten as much pleasure or knowledge as its first issue gave me it will indeed meet a long-felt want, and all who are concerned in popularizing the invention will have reason to bless the day that the little messenger was started.

### A Phenomenal Feat in Reporting.

THE following from the *Commercial Advertiser* of January 20, is interesting, showing as it does how great an aid the phonograph is to stenographic reporters. It may not be generally known, but it is a fact that the phonograph has been in use in both Houses of Congress for over two years, as an auxiliary to the regular reporters.

The greatest feat of reporting that has ever been performed by the official reporters of Congress was that of preparing the Senate report for the *Record* Wednesday night. The chief reporter is ill, and only two men were available to do the work. The Senate was in session for fourteen hours, all of which time was spent in an active discussion of the Silver Bill. It was after 12 o'clock at night when they adjourned, and during the session they had talked over 120,000 words. Two stenographers took the report and, by dictating their notes into phonographs, for typewriters to transcribe, they had all the copy ready for the printers by 8 o'clock in the morning, and the *Record* was on the desks of the Senators when Congress convened.

### The Manufacture of Musical Cylinders.

BEING requested by the manager of one of the local companies to give some points on the making of musical records, we cheerfully comply. In order to be able to do so, we have carefully investigated the subject, and find that there are no new features in this business, excepting those which Mr. Edison has developed, and which he proposes to put into practical use at some future time. He has been experimenting for a long time in this direction, and can now make musical and other records such as orations, lectures, etc., far superior to anything that has ever heretofore been produced. In order, however, to prepare for doing this business properly, it will be necessary to invest a large sum of money in a plant, which would not be justified by the present condition of the musical-record business, owing to the fact that so many of the local companies are trying to make these records for themselves; this being the case, the parent company does not see its way clear to take advantage of the improvements Mr. Edison has made, but we are told that if the local companies should unite in a request to the parent company to do so, and would agree to desist from the manufacture of the same

themselves, arrangements would be speedily made for the establishment of a manufactory of such records under Mr. Edison's personal direction, and we have little doubt but that perfection of quality together with cheapness of production would soon be reached. Until that is done, however, we cannot see any encouragement for improvements in this line.

## "Stage Fright" Produced by the Phonograph.

THE first appearance of an actor or singer before the phonograph is a study by itself, and well worth the observation of a student of human nature. It would naturally be supposed that these people, who pass their lives in the glare of publicity, would approach the machine with the same sang froid and self-possession which characterizes them on the stage, and, in most cases, this is a fact. But some of the most collected of them when before an audience, become victims of "stage fright" before the phonograph, and when they succumb to this it is most difficult to secure a good record. Scores of actors and actresses have stood before the large horns attached to phonographs, who never felt the slightest quiver when facing an audience, but who, when subjected to this ordeal, have become like bashful schoolboys forced by a stern master to "speak their first piece" on a seven-by-ten platform.

The collection referred to above includes voice phonographs of actors and actresses, ranging from such men as Jefferson and Florence to the smaller artists of the variety stage. In the case of Jefferson and Florence the collector took his phonograph to the dressing-room of Mr. Jefferson during an engagement at Palmer's. The veteran actor listened to the reproductions of some songs and recitations, half-clad in the costume of Dr. Pangloss, and painting his face to the proper make-up the while. Mr. Florence stepped into the room and listened, too, and both finally consented to give a portion of the scene from "The Rivals," in which Sir Lucius O'Trigger is arranging with Bob Acres the details of the proposed duel. There was not the slightest evidence of "stage fright" exhibited by these two finished artists. They were as easy and natural, as they stood before the big-mouthed horn, as they are upon the stage. Mr. Florence began with the snatch of song, "For He loved a Bold Dragoon," and the two men fastened their dialogue upon the cylinder until Jefferson ended with the speech, "You oughtn't to talk to a man like that, at a time like this, to a man like that." The peculiar high voice of Jefferson and the rich brogue of Florence were all accurately recorded, and can now be produced at will by the owner of the cylinder. Jefferson and Florence may be thousands of miles away, but their voices are held firmly here in New York, and their little bit of exquisitely funny dialogue from "The Rivals" can be repeated at any time with as much effect as though the two noted actors were present to recite it.

## The Tariff on Phonographs.

CONGRESS and the custom-house officers are threatened with a new tariff difficulty in the shape of the phonograph. And it is easy to see that so remarkable an invention must have a material influence on the commercial relations of men. Its peculiarity is that its value as a commodity will depend entirely on what it contains. A phonograph charged with the mongrel music of an amateur would have no other value than that of the wax and other material of which the instrument was composed. But stocked with a speech of Gladstone, Bismarck or the pope, or a song by Patti, or a new opera by Verdi, it would have a large cash value, and as such would seem to be within the field of taxable imports.

# THE FOOTPRINTS OF SOUND.

BY FRANK M. DEEMS, M. D., PH. D.

ACCOMPANYING this article is a picture of the footprints of sound; in this case, of articulate speech. Does the phrase seem a fanciful one? If so, be assured that the picture represents not only the footprints of sound, but the shadows of an echo as well. In other words, it is a micro-photograph of a record—a phonogram taken from an Edison phonograph cylinder. For the benefit of such readers as are not familiar with Mr. Edison's wonderful tone-recorder, let me explain in detail, step by step, how this pic-

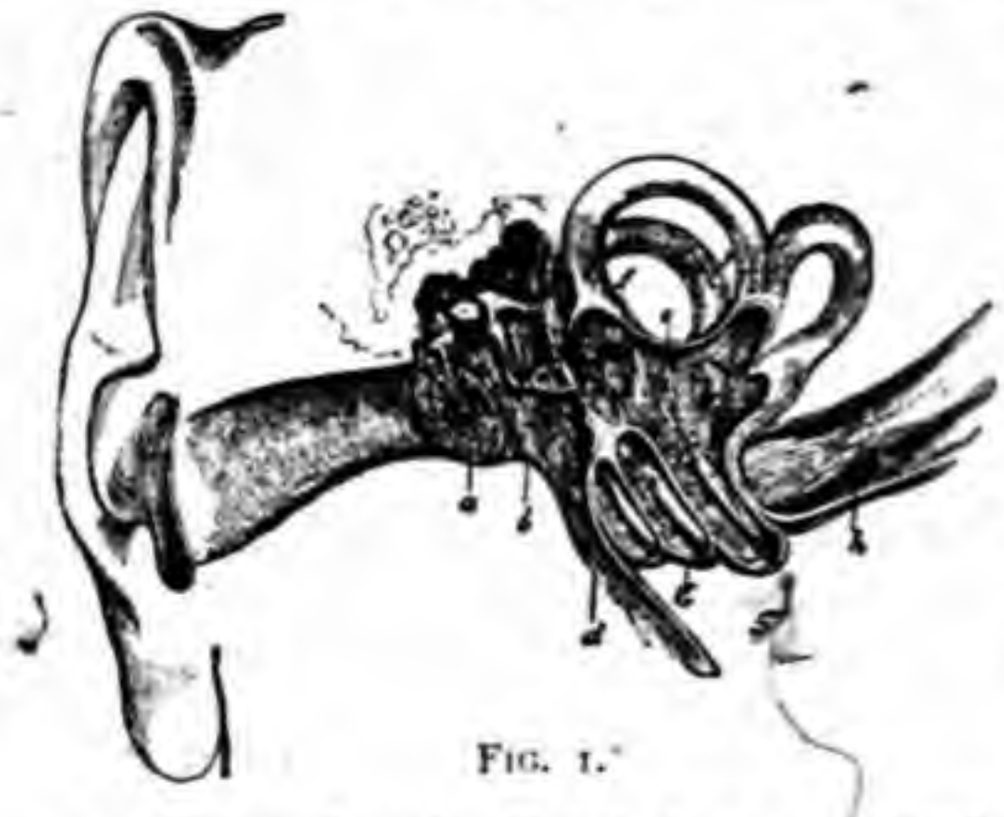


FIG. 1.

ture was produced. But before so doing I will draw a parallel between the phonograph and the human ear. Up to a certain point there is a striking similarity between the mechanical construction of the phonograph and the structure of the human ear. This will be better shown by a reference to the accompanying diagram of the ear (Fig. 1). The outer ear is funnel-shaped; it is, in fact, a natural hearing-trumpet. This serves the purpose of collecting the vibrations of the atmosphere which constitute sound, condensing and conducting it. In the phonograph there is a corresponding funnel for the same purpose. At the bottom of the outer ear-funnel there is a membrane, a beautiful structure a little thicker than gold-beaters' skin. This is the tympanum, or, as it is more commonly called, the "drum of the ear." At the bottom of the phonograph speaking-tube, and corresponding exactly to the ear-drum, there is a small circular piece of thin microscopic cover-glass called the diaphragm. In the ear there is attached to the inner surface of the ear-drum a movable chain of three small bones, called the "hammer," the "anvil," and the "stirrup," from their close resemblance to the objects above mentioned. These three little bones are so arranged and connected that we may regard them, as a whole, as a compound lever automatically operated by two small muscles. This chain of bones serves a double purpose: it keeps the ear-drum gently on a stretch, but delicately adjusting it to each varying impulse with which the air comes laden, tightening it so that it thrills to every whisper, loosening it against the injurious effects of sounds too loud. But they serve a yet more important purpose: they receive the vibrations from the ear-drum to which they are attached, and convey them cross the cavity of the inner ear to the nervous expansions of the auditory, or hearing nerve. In the phonograph the part corresponding to this chain of bones is called the stylus, or engraving pen. It consist of a little hinged lever cemented to the under surface of the thin glass diaphragm. It is tipped with a point of sapphire. This sapphire point, being exceedingly hard, never loses its shape or polish by wearing away, or from corrosion. It is not necessary to go into the complicated but wonderfully beautiful arrangement of the auditory nerve: suffice it to say, that in the phonograph the wax cylinder takes the place of the nerve and brain. So, we see, there is really a close analogy be-

tween the mechanism of the phonograph and the anatomical structure of the ear. Now, similarity of structure implies similarity of function, and, up to a certain point, their *modus-operandi*, their action is alike. Sounds are made; in the case of hearing, the funnel-like outer ear collects and condenses these atmospheric vibrations, and they beat against the stretched membrane of the ear-drum, and it vibrates; as it does so it sets the movable chain of bones attached to it into similar vibrations, and they pass these vibrations on to the expanded portion of the auditory nerve, where they are registered as sensations, and these sensations being transmitted to the

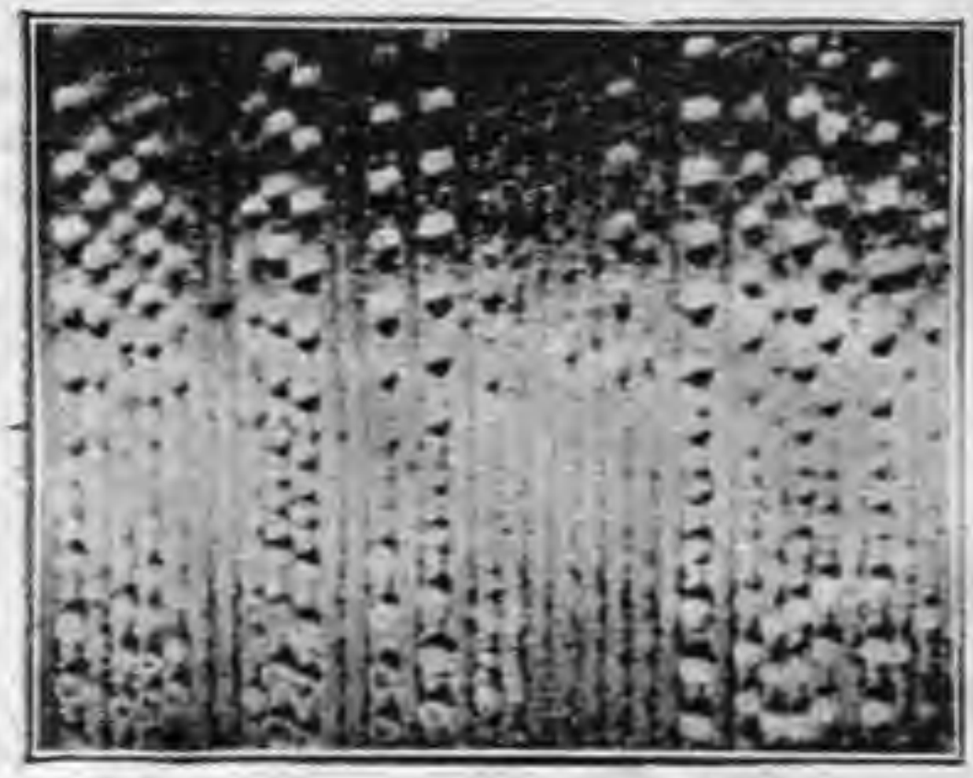


FIG. 2.

brain, are in some mysterious way translated into conscious sound, which is hearing. In the case of the phonograph, the speaking-funnel collects the atmospheric vibrations which constitute sound, and they beat against the thin glass diaphragm, and it vibrates; as it does so it sets the sapphire-pointed stylus attached to it into similar vibrations, and this point engraves these vibrations upon the surface of a revolving wax cylinder, in the form of indentations more or less deep, according to the loudness of the sound, and closer together or further apart according to the pitch of the sound and the rate of the movements of the cylinder. These indentations are what I have ventured to call the footprints of sound. Now, these minute spiral lines of indentations made by sound-waves can be photographed by using a microscope lens in the camera, and that is called a micro-photograph. Such a micro-photograph is the illustration (Fig. 2) in this article, and which I have ventured to call the shadows of an echo. Of course, they can be almost indefinitely enlarged, and each tiny footprint of a sound could be made as large as a cart-wheel, if that were of any use. Yes, the phonograph is first an ear, and then a whole vocal apparatus—larynx, throat, tongue and all—and Thomas A. Edison is still the "Wizard of Llewellyn Park"

### A Memorial Heard Through a Phonograph.

A SHORT time before Browning's death Miss Ferguson, at the studio of Mr. Rudolph Lehmann, succeeded in persuading him to speak into a phonograph. The lines he spoke into the instrument were a portion of his own poem, "How they brought the good news from Ghent to Aix." The instrument, not being human, which never lies and never exaggerates or changes when it repeats what has been told it, proved that Browning spoke the first two lines,

> "I jumped in the saddle, and Joris and he;
> "I galloped, Dick galloped, we galloped all three."

straight off; but when he came to the third line there was a stumble, and presently came the words, "I forget." He tried to remember the line, which every schoolboy throughout the English-speaking world can repeat without the slightest hesitation, but he broke down again. The instrument repeated the apology he made for forgetting his own poems, and the eulogy he delivered on Edison and what he termed his "wonderful invention." Then there was a pause, while the cylinder continued to revolve, and presently came a loud "Robert Browning," as if the poet had, with his own voice, signed his name to the effort.

## A NEW AUTOMATIC PHONOGRAPH.

THE Automatic Phonograph Exhibition Co., which controls the patents of the "Nickel-in-the-Slot," is putting out a new machine (as shown in our illustration) which is a great improvement over the old one, of which there were about 750 in use from Maine to Montana.


The advantages of the new machine are as follows: First, starting the machine with a crank instead of the side push bar; with this arrangement it is impossible for the machine to get out of adjustment. The second new feature introduced is that, inserting the nickel requires the playing of the entire selection by the phonograph.

In the new machine electric current is not started—that is, the connection is not made until the last moment, and the battery power is never wasted. It is also impossible to lose the nickel, even if the instructions on the card are not followed.

An important feature of the new machine is that plugs, wads, buttons, etc., will not work, and only an exact counterfeit of a nickel in weight and size will operate the phonograph.

The factory is now running night and day to supply new machines in place of the old style. The receipts show no perceptible decrease or increase, but in some special cases, favored by location, some machines pay as much as $24 in one day. The receipts increase or diminish in various machines, as the records, which are changed daily, are good or mediocre—like a theatrical production—"a good show drawing a full house," and different localities require different attractions.


### The French Tariff and Electricity.

THE French Chamber of Electrical Industries has adopted a report of its Committee on Tariff, recommending the advocacy before the government of the following as the minima rates of duties on electrical apparatus in the revision of the French Commercial Treaties to go into effect after February 1, 1892.

| | AD VAL. |
|---|---|
| Dynamo electric machines weighing more than 22 lbs. | 10% |
| Arc lamps, known as regulators | 10% |
| Incandescent lamps | 20% |
| Crayons for arc lamps | 10% |
| Accumulators | 10% |
| Electric cables | 5% |
| Inductors for dynamo machines | 20% |
| Bobbins, full or not, made of metal, covered with copper wire, insulated. | 20% |
| Parts made of copper weighing less than 1 kilogr. (2.2 lb.), numbered or marked, either set up or separate, intended for electric machines | 150 fr. per 220 lbs. |

An important meeting of the members of the National Electric Light Association will be held at Providence, R. I., on February 17, 18, 19. This will be the thirteenth session of this society, and an effort is being made to have the following distinguished men speak on their specialties: Dr. Norvin Green on "Telegraphy"; Cyrus W. Field, "Ocean Telegraphy"; A. G. Bell, "Telephone"; C. F. Brush, "Arc Light"; T. A. Edison, "Incandescent Light"; Prof. Elihu Tomson, "Electric Welding"; Henry M. Whitney, "Electric Railways."

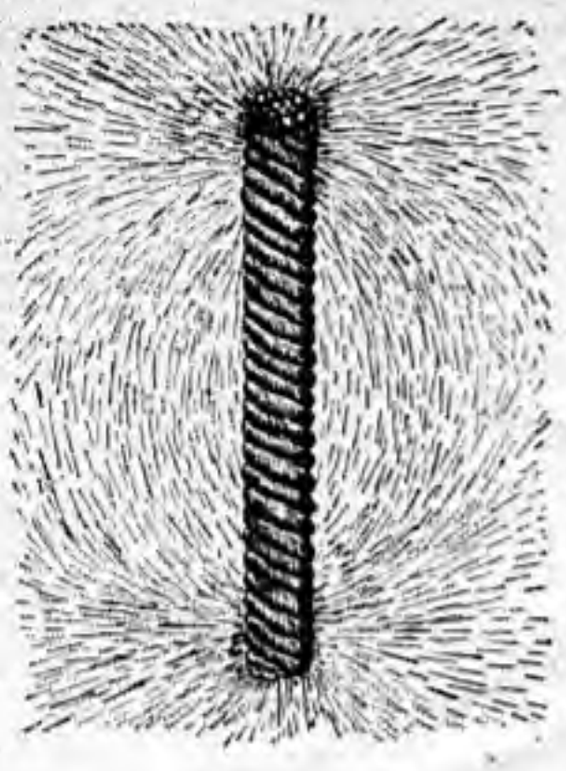
### Thermo-electric Piles and Generators.

FROM the following facts a good idea may be had of the relative values of thermo-electric piles and dynamos worked by gasometers for the transmission of thermic energy contained in gaslight into electric energy. All the experiments made with the latter show a consumption of over 3,051 cub. in. per watt-hour, or, say 1,060 cu. feet per kilowatt-hour. A well-constructed gasometer will consume from 21 to 24 cu. ft. of gas per horse-hour, and can yield 600 watts available on a dynamo whose product does not exceed 85 per cent., which under the most favorable conditions equals 61 cu. in. per watt-hour or 35.3 cu. ft. per kilowatt-hour. Hence, for a given amount of electric energy a good thermo-electric pile will consume about 30 times more gas than a generator made up of a gasometer and a dynamo. Moreover, there is no thermo-electric pile on sale whose available power exceeds 10 to 12 watts, whereas gasometers are regularly made of 100 horse-hour.

# THE FOUNDERS OF ELECTRICAL SCIENCE.

BY FELIX DAHN, PH. D.

## No. 1.—WILLIAM GILBERT.



IN the latter part of November, 1889, in the rooms of the Society of Arts in London, a large gathering of representative electrical and other scientific men met together. It was the inaugural meeting of the "Gilbert Club." The chair was occupied by that Nestor of living electricians, Sir William Thomson. The objects of the club were clearly stated in the following resolution, which was unanimously adopted: "That the objects of the Gilbert Club be as follows: 1. To produce and issue an English translation of *De Magnete* in the manner of the folio edition of 1600. 2. To arrange hereafter for the tercentenary celebration of the publication of *De Magnete* in the year 1900. 3. To promote inquiries into the personal history, life, works, and writings of Dr. Gilbert. 4. To have power, after the completion of the English edition of *De Magnete*, to undertake the reproduction of other early works on electricity and magnetism, provided at such date a majority of the members of the club so desire." Such an ideally wise thing should be greeted with loud applause. Science is pledged to rescue the names and deeds of her neglected worthies from unmerited obscurity, and to see to it that their services shall not be eclipsed by the false glory of contemporary place-fillers, mere kings and potentates, nor by the noisy fame of empty politicians. She will set them in their appropriate niches in her Westminster temple of fame, and when she does so, high and conspicuous among the places of honor will be that of Queen Elizabeth's physician, Dr. William Gilbert, the father and founder of electrical science. His name is worthy of being kept in perpetual and honorable remembrance, both for what he was and for what he did; and therefore it is an encouraging sign to see honor done to him by his own countrymen, for in his own day it was not so. William Gilbert was born in Colchester, England, in 1540, and died in London, 1603. Francis Bacon was born in 1561, when Gilbert was just twenty-one years of age. In the year 1600 —three years before his death—note the date, it is easy to remember, and is a landmark in the history of science—he published his famous work, *De Magnete*, with which began the science of electricity. Exactly two hundred years later, in 1800, Volta was to give the world a new electricity, so to speak. It is a curious fact that the name of almost every notable discoverer between Gilbert's, 1600, and Volta's, 1800, should begin with the letter G; they are, in their chronological order, Gilbert, Gray, Guericke, and Galvani. Not only was Gilbert's great book in every respect an admirable treatise, but it was a pioneer, an epoch-making book, for in it the facts of magnetism and its general laws were for the *first time* investigated and enunciated. That alone would have been much, but Gilbert's greater glory lies in this: that, with but few exceptions, these very facts themselves were *experimentally* discovered and wrought out by Gilbert himself; and his analysis of them is a monumental and masterly example of the inductive method. Gilbert had no predecessors; he was a scientific Columbus. The single fact that amber (a fossil gum), would, when rubbed, attract small light particles, was about all there was known of

electricity before Gilbert's time. The Greek word for amber is *elektron*, hence Gilbert called its attractive property *electricity*. But very little more was known of magnetism than of electricity.

The ancients knew that in Magnesia in Asia Minor there were certain black stones which possessed the remarkable property of attracting to themselves bits of iron and steel. They called them "magnets" from the name of the locality whence they came. They found that an elongated piece of such a stone, if suspended by a thread, would always point north and south. They called such bodies "loadstones" (leading-stone). There we have the whole sum of the knowledge of magnetism that the ancients possessed.

In 1600 Gilbert published his researches, wherein he showed that other bodies, some twenty at least, possessed similar attractive power when rubbed, as did the amber of the ancients. He called them *electrics*. But it was as to magnets and magnetism that he made his more valuable and interesting investigations. He discovered the polarity of natural magnets, and he called them "poles," and considered the laws of polarity. He discussed the grouping of iron filings about the poles of magnetic bars, and made the distinction between magnets and magnetic bodies. He made all kinds of artificial magnets. Gilbert also propounded the astonishing discovery that the earth itself is a huge magnet; that its magnetic poles coincide very nearly with its geographical poles, and that, therefore, it causes the compass needle (itself a little magnet), to place itself when freely suspended, in a north and south position. All these and many other questions he treated by purely inductive and experimental methods. And now we are confronted by a surprising historical fact.

WILLIAM GILBERT.

It has been said that Lord Bacon was a contemporary of Dr. Gilbert. One would have thought that he would have hailed with generous and enthusiastic delight such a conspicuous example of the inductive method But no. On the contrary, in his *Novum Organum*, he severely condemns Gilbert's great work, singling it out as a peculiarly striking instance of inconclusive reasoning, and of truths distorted by preconceived fancies. Elsewhere he alludes to the "electric energy concerning which *Gilbert has told us so many fables.*" It has been well said, "a century and a half later, as we shall see, these 'fables' assumed the form of realities. The sweeping censure of so high an authority seems to have produced its natural effect, and may have had much to do in materially retarding the development of the infant science." But this was not the only

instance of Lord Bacon's failure to recognize the best inductive labors of his own time, for he rejected the Copernican theory as well.

But science recognizes no boundary lines, knows no provincial prejudices; and where English Bacon failed to recognize a fellow-countryman's merit, Italian Galileo said of *De Magnete* and its writer, "I extremely admire and envy this author. I think him worthy of the greatest praise for the many new and true observations that he has made, to the disgrace of so many vain and *fabling* authors, who write not from their own knowledge only, but repeat everything they hear from the foolish vulgar, without attempting to satisfy themselves of the same by experience—perhaps that they may not diminish the size of their books."

Posterity has reversed Lord Bacon's unmerited censure and confirmed Galileo's encomiums, and the fame of William Gilbert, like that of every true scientist, will continue to grow brighter and brighter.

### Electricity in Place of Steam.

THE possibility of electricity being used as the motive power for railroads in the future is assuming an interesting condition. Stations may be located some forty or fifty miles apart, which will be run by large engines, and from recent tests it is found that an electric motor will mount a grade of more than fifty per cent. Not only on railroads, but on the ocean steamers will a new era be inaugurated when electricity is introduced. The advantages being a saving of expense, higher rate of speed, and the danger of accidents decreased.

LOVERS of statistics will find something of interest in the fact that about ten million incandescent electric lamps will be made in the United States during 1891. They will involve the use of 125,000 ounces of platinum, which costs at present $20 per ounce.

### The Telegraph in War.

FOR all we know to the contrary, the general of the future will be a quiet man at the end of a telegraph wire. To a certain extent this description applied to Field-Marshal Von Moltke. But it will be still truer of the successful leader in the next European war. A recent dispatch from London says: "An elaborate system of war telegraphing has been arranged between the Admiralty Department and the Post Office. It is now possible by this arrangement, upon short notice, to connect every telegraph station on the coast directly with the Admiralty office."

Quite a contrast betwen the old picture of "the Duke of Wellington riding about amid fire and cannon balls," and a military leader who does his work sitting at a desk in an office like a merchant, conning bulletins from his various subordinates as they come in on a "ticker," and dispatching orders, not by aides-de-camp, but by telegraphic dispatch, just as a speculator wires his broker to "buy ten September." There is nothing dramatic about that way of conducting a campaign. The picturesqueness of poetry is knocked out of war, and it has become a grim business even in its superficial aspects, as it always was in its underlying reality.

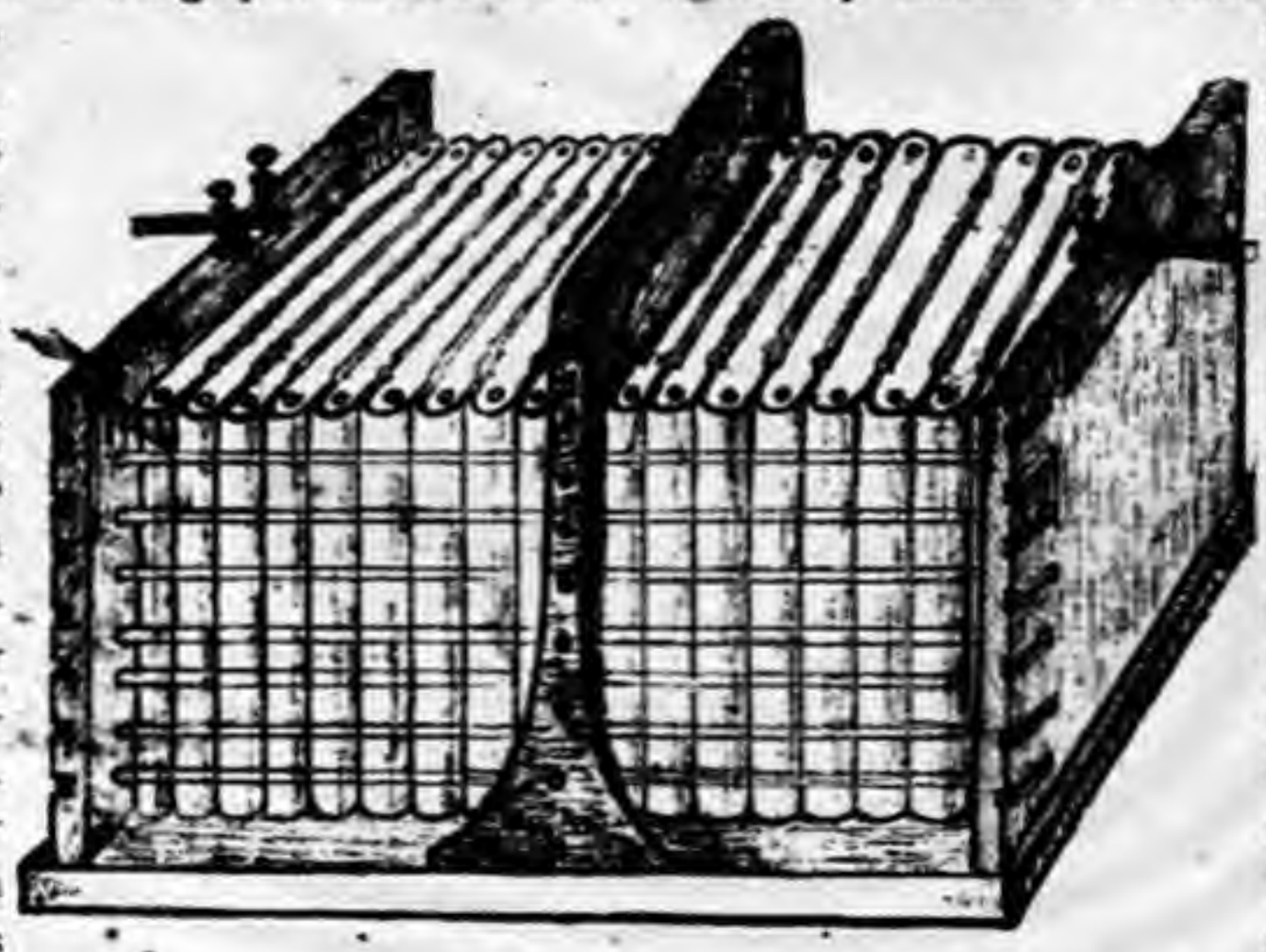
### A New Device.

THE insumgraph is a new device for checking the time of arrivals of employees at a factory or other premises, and unlike those already in use, it cannot be deceived except by forging the handwriting, for it takes the signature of the employee.

## AN ELASTIC ACCUMULATOR.

NOVEL DEVICES THAT ARE FACILITATING MAN'S WORK AND PROMOTING THE WORLD'S PROGRESS.

AN elastic battery, just invented by Mr. Emile Reynier, is described by *L'Electricien*. It consists of sixteen elements set up in pockets or flexible wallets. They are placed flat against each other and tightly compressed between two stiff backs that are drawn toward each other by rubber springs. A bridge-like frame made of hard wood, and covered with a preparation against water, built over the middle of the apparatus, serves as a handle, by means of which the battery can be hung up or carried about according to requirement. The springs impress an artificial elasticity on the active solids, thus enabling the battery to attain a high degree of specific power and great specific capacity. The steady compression of the plates or backs against the insulators and receivers secures these most important parts against breakage and shocks. Each couple is corked with an elastic insulated stopple. The following data are given by the inventor for the 16-couple battery which he calls *cheval-heure* (horse-hour): Electromotive power, 32 volts; Discharge of available potential, 28 volts; Intensity of the current of discharge, 3 to 6 amperes; Normal available power, 150 watts; Voltaic capacity about 30 amperes-hour; Available energy about 740 watts-hour. The exterior dimensions are (over all): Length 0.40 metre; Width 0.30; Height 0.30. Total bulk, without the case, 36 cubic decimetres. Total weight, without the case, 50 kilograms; Weight per kilowatt, 330 kilograms; Weight per kilowatt-hour, 67 kilos; Volume per kilowatt, 240 cubic decimetres; Volume per kilowatt-hour, 49 do.



MRS. MARY LOWELL, best known as the "Electrical Star," has turned her love for electrical engineering to practical account. Being without a servant, she determined to try whether the kitchen fire could not be lighted by means of a tame flash of electricity, so to speak, and have it well started before she got up herself. She prepared wires to and from her bed-head to the kitchen grate, thus completing an electric current with the aid of a small battery, and all that then remained to be done was to so "build" the fire that the materials should become easily ignitible.

The wires were connected by a piece of platinum, and round this was loosely wrapped what firework-makers call "lighting paper." Over this again was strewn some tissue paper, upon it placed a wheel of firewood and on the latter the coal.

At 7 in the morning, when the fire had to be lit, the electricity was turned on. The platinum lit the lighting paper, then the tissue, the tissue the firewood, and the firewood the coal. On descending to the kitchen the kettle was boiling and the place comfortably warm.


**A Remarkable Experiment in Phonographic and Telephonic Transmission between New York and Philadelphia.**

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This experiment was shown by Mr. William J. Hammer in his lecture upon "Edison and his Inventions," delivered before the Franklin Institute, February 4, 1889. It employed two Edison phonographs, two Edison carbon telephones (transmitters), two Edison motograph receivers or loud speaking telephones, two induction coils, two sets of batteries and one hundred and three miles of long-distance telephone wire, six miles of which was under-ground and underwater cable.

It will be observed that the sounds, which consisted of talking, singing and cornet playing, were transmitted through the air five times, and were transmitted through no less than thirteen mediums from the speaker and musician in New York to the audience in Philadelphia.

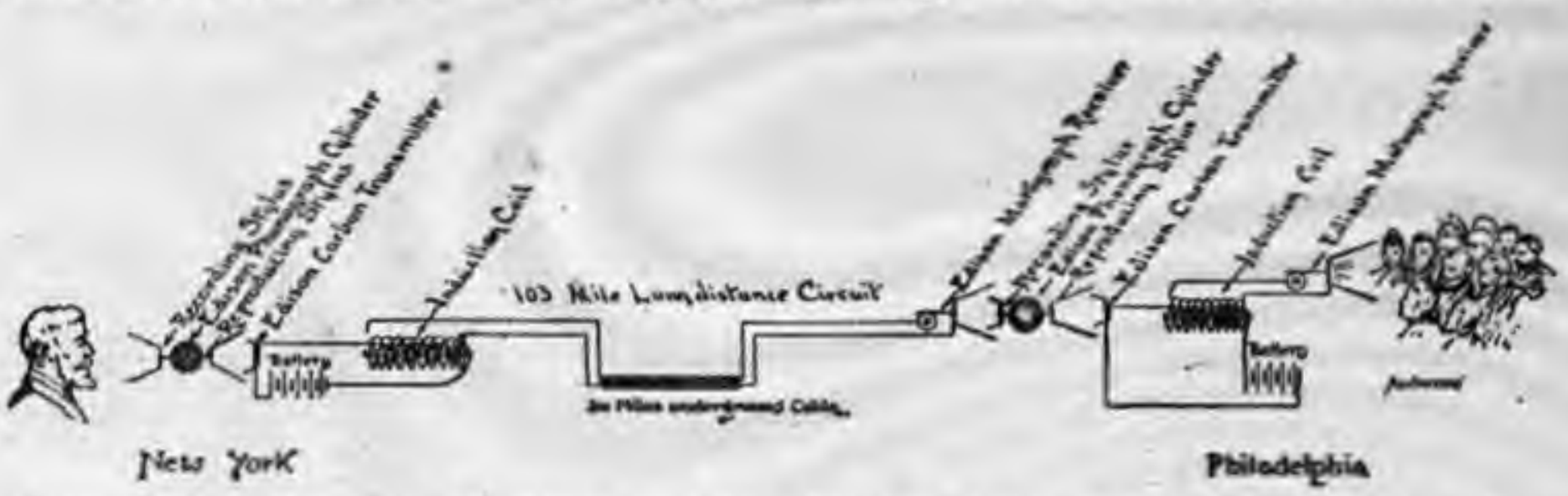
These mediums included vocal chords, cornet, air, glass, iron and mica diaphragms, carbon buttons, stylus of steel, palladium-faced pens, hydrogen gas (evolved between pen and surface of chalk), wax and chalk cylinders and copper wire.

The physical conditions of the sound-waves were changed no less than twenty-one times in transmission, as follows: (1) Air waves produced by vibration of vocal chords in speaker's throat or by the cornet. (2) Vibrations of a diaphragm. (3) Undulations in wax. (4) Vibrations of a diaphragm. (5) Varying pressures in a carbon button. (6) A pulsating electric current. (7) An undulating magnetic force. (8) Alternating electric currents. (9) a varying force of adhesion. (10) Vibrations of a diaphragm. (11) Sound-waves. (12) Vibrations of a diaphragm. (13) Undulations in wax. (14) Vibrations of a diaphragm. (15) Varying pressures in a carbon button. (16) A pulsating electric current. (17) An undulating magnetic force. (18) Alternating electric currents. (19) A varying force of adhesion. (20) Vibrations of a diaphragm. (21) Sound-waves translated into words by the auditory nerves of the hearers.

The experiment shows three of Mr. Edison's remarkable inventions working in juxtaposition; *i. e.* his carbon transmitter, his motograph receiver and his phonograph.

It is also interesting to note that at the time of the above-mentioned lecture, that by means of transmitters placed upon the stage, the lecture was listened to by people in some fourteen different places. Music and talking were transmitted by the Phonograph over the telephone to Buffalo, Rochester, Boston, Syracuse, New York, Orange and elsewhere, from the Franklin Institute stage, through the courtesy of the Long Distance Telephone Company, of New York, who kindly placed their lines at Mr. Hammer's disposal for these original experiments.

In addition to the above experiments Mr. Hammer conducted some of a somewhat similar nature during the Paris Exposition, at the residence of M. Louis Rau, the occasion being an informal gathering of the electrical section of the jury, of which M. Rau was a member, his handsome residence which is lit with the incandescent light, and is connected with the Opera by telephone, was, upon the occasion referred to also, put in connection with the Edison Phonograph




Pavilion in the Palais des Machines, and by means of phonographs talking, singing, bugle-calls, etc., were transmitted across the city through the telephones, and were plainly audible all over the room.

An interesting experiment was shown in which singing, talking, and other sounds made upon one-half of a cylinder of a phonograph situated in the parlor was sent through a telephone line to a phonograph upstairs, where it was recorded, after which it was retransmitted downstairs, and recorded again upon the last half of the cylinder it originally started from. The experiment was successful although the final reproduction was very faint owing to the hasty arrangements. Another very interesting experiment which was carried out while at Paris, which opens up another new field for the phonographs, was the sending off phonograms attached to parachutes from a balloon during a trip made by him of over 100 miles from Paris. As the result of his experiments, Mr. Hammer feels certain that this method of sending dispatches from balloons in time of war is very feasible, and presents points of utility and value superior to the carrier-pigeon service. He found by properly proportioning and weighting the parachutes they could be dropped with considerable exactitude.

## THE TELEPHONE IN PARIS.

UNTIL within the last year the price of public service has been 1,200 francs; it is now 600 francs. Formerly subscribers had to go to headquarters to pay; at the present time their bills will be collected at their own offices for an additional charge of 25 centimes. On October 1, 1889, there were 6,300 subscribers; in a year there were 7,800. The disturbances in the lines were 2,000 a month; of these only 55 or 60 were in the subways, or about 0.75 per hundred subscribers. In 1887–88 more interruptions occurred, because the lines had been already seven or eight years in use, and were very defective; but at the beginning of 1889 the cables were repaired, and all the defective parts removed. The Department is now about to inaugurate a large number of cables of 7 double conductors each, so as to connect several offices with each other, and thus shorten the time of communication, which is still pretty long. The night tariff has also been revised, and is now 30 centimes for ordinary conversation, and 20 centimes to subscribers per 100 kilometres or about 160 miles.


### The First Typewriter.

A MODEL of the first writing machine made in this country was exhibited a short time since. It was patented in 1843 by a man named Charles Thurber, of Massachusetts, and is a really amusing affair in its very clumsiness. It consists of a wheel about a foot in diameter which turns horizontally upon a central pivot; the rim of the wheel is bored with twenty-five holes, in each one of which is a rod bearing at the top a glass letter and at the bottom a similar letter of steel. The paper sheet is so arranged that the line to be printed is under the rim of this wheel, and the letter wanted is swung into place by turning the wheel; when in place, a rod bearing it is depressed until the steel letter or type touches the paper. I should say that even the fastest operator could not write more than half as fast as a man with a pen. Yet it was a writing machine, and Thurber succeeded in getting people to invest $15,000 in this curious device. At present there are no less than forty-seven different kinds of typewriters made and sold in this country, and in New York City alone there are said to be more than 3,000 expert operators, making a living by typewriting.

WITH most of the newspapers and magazines the use of the typewriting machine for preparing copy for the printer, is becoming almost universal—in fact, the United Press Association, and many of the syndicates which furnish a large amount of matter for publication, refuse to receive "copy" unless transcribed by the typewriter. The saving of time both to the writer of the MSS., and the facility with which it may be examined, and set up in type, is a very important matter to the publisher, while the chances of its acceptance are increased.

IF there were as many phonographs in existence as there are typewriting machines at the present moment, the correspondence of thousands of people would be effected by the transmission of their own voices in the place of their own handwriting.

When the thirty or forty companies already organized apply their energies to the introduction of the phonograph, so that it shall be as common in the household as the writing machine, its usefulness will become epidemic, and where one instrument is found at the present time, a thousand will be found hereafter.

"You have no idea of the number of typewriting machines stolen from the offices of professional men," said a prominent business-man. "Only a day or two ago I had a funny case reported to me. A prominent

lawyer—a judge—and his typewriter, the one who operates the machine, went out to lunch, and left the office unprotected. After a nice, appetizing lunch the young clerk returned to the office, and was filled with consternation to find his writing-machine gone. With breathless haste he rushed out to tell his principal, and they hurried back as fast as possible. But imagine the clerk's surprise when he discovered that during his second absence the thief had returned, and taken the handsome cabinet desk away. The loss was immediately reported to me, and as we keep a record of the number of every machine sold, we soon traced the thief, and got the machine and the desk. Never a week passes but some one reports the loss of a machine, with a request that a lookout be kept by our men, who are always on the go, and know every machine in the districts which they cover. It is not an easy matter to steal a machine and escape detection if the thief remains with it in the city. Some time repairs will be needed, and the number will expose the criminal. My experience is that of every other big typewriter company in the city."

THE possibilities of the typewriter are significantly illustrated in two ways: First, a deaf-dumb-and-blind young man, now in one of the New York institutions, is enabled to communicate with the outside world with as much freedom as if he could see like the rest of us. The subject of dictation or conversation is communicated by touches on the back of his hand. A simple device announces to the writer when the end of the line has been reached. The second great way in which the typewriter has been employed is connecting its key with a battery and printing its matter miles away. In a little while we shall have a typewriter more perfect than any other which does the work in shorthand. The wonders of mechanism seem only to just have begun.

NOW the Phonographist almost leads the speaker, because, in a measure, he anticipates what words are coming out of his mouth.

This method of reporting is swifter than stenography. There is no question that rapid speaking may be more faithfully reported by the phonograph than by the shorthand method. Newspapers in the future will use the phonograph-man a great deal where they now use the shorthand-man. The cylinders need not necessarily be written off to make copy for the compositor. The reporters may be sent direct to the composing-room. Just think what this means in cases where time is short and presses are waiting.

A TYPEWRITING machine will shortly be introduced to the public which combines new features of importance not found in any other machine. This machine, which is now being extensively used in London and Paris, will be called the Bar-lock, and in our next issue a full description of it will be given.

A NEW typewriting machine has been invented, making letters which the blind can understand. It is made under the "point" system, and has many improvements in the construction and arrangement of parts in the carriage, feeding, spacing, and embossing mechanism. It is the invention of a Texan lady.

ANOTHER new machine, also the invention of a Texan, consists of a keyboard carriage pivoted on a threaded shaft; in a light frame an inking apparatus and mechanism moves the carriage along the shaft. This machine is small enough to be carried in the pocket.

## PHONOGRAPH CHAT.

MR. EDISON hinted at some experiments which he intends to make to determine, if possible, if certain insects emit sounds which are inaudible to the human ear because of the rapidity of the vibrations of the sound waves. He will place them in the diaphragm for a few moments with the phonograph revolving at a very high speed, and then, with a greatly reduced speed, endeavor to reproduce any sound that may be recorded.

THE Automatic Phonograph Exhibition Company obtained a temporary injunction on the N. A. P. Co., the 13th of December, 1890, restraining the latter company from selling phonographs, without restricting their use in connection with a nickel-in-the-slot device. The case was argued in the U. S. Circuit Court before Judge Lacombe, and on the 21st inst. he handed down his decision continuing the injunction, but expressly reserving the graphophone.

THERE has been much rumor about a new machine—but we know for a fact that while such a thing is in contemplation, yet it will be some time before it will be ready for the market, as it will have to be submitted to thorough trial to prove its superiority over existing types and then the making of special tools, etc., all takes time.

MR. AUGUST N. SAMPSON, General Manager of the New England Phonograph Co., visited the city last week, and reports business booming in the New England States. They have placed over fifty automatic machines, and are reaping a harvest, especially in the country towns. Mr. Sampson has had large experience in the phonograph business and is rapidly developing a large trade in the Eastern States.

MR. F. A. ASHCROFT has charge of the exhibition department of the New England Phonograph Co. He exhibited the phonograph at Melrose, Mass., before a very large audience, and was highly congratulated on the success of the affair. Another exhibition was given in the Hawes Street Unitarian Church, which was repeated four times by request.

A NEW PHONOGRAPH COMPANY.—The Arkansas Edison Phonograph Company have filed articles entitling them to the right to manufacture, purchase, lease or otherwise obtain the Edison Phonograph, and to lease or sell State rights of the invention in this State. The capital stock is $10,000, subscribed by N. Kupferle, W. G. Brown, and H. G. Allis. This firm has fitted up comfortable quarters on the first floor of the Allis Block. Mr. Brown has charge of the business.

THE many friends and the electric trade generally will be glad to learn that Mr. A. O. Tate, secretary to Mr. Edison, is rapidly recovering from his recent illness.

THE Texas Phonograph Co. control a nickel-in-the-slot device which will soon be put on the market.

THE Missouri Phonograph Co. have opened several new offices in different parts of their territory and say they feel very much encouraged over the phonograph prospects.

THE cutting needle and knife and the reproducing needle are now made of sapphire or diamond. A single diaphragm of glass is used, that being found the most satisfactory, although diaphragms of iron, steel, aluminium and other substances answer well. The phonograph has been greatly simplified, and is rendered very sensitive to delicate sounds, by the new sapphire needles and the new cylinders. The machine is geared so that the cylinder will hold a long dictation.

IN the *Pocket Magazine* of 1818 is written an article purporting to look forward 500 years, and giving among a list of inventions then to be completed "a machine to imitate the human voice which will be worked by machinery in the manner of a barrel organ. It will be called the vocal instrument, and will be used in the churches to read prayers." We have not waited the 500 years, but the pifonograph is perfected, and though it has not been used to read prayers in churches, it frequently reproduces sermons of notoriety-loving parsons.

AT Budapesth a phonograph is now exhibited from which the voice of Louis Kossuth can be heard on payment of an entrance fee. The voice of the venerable revolutionist is described as still sonorous in spite of his great age.

AT the late meeting of the Metropolitan Stenographer's Association held at the Club House, No. 95 Lexington Ave., on January 8, the utility and ease with which the phonograph could be used was clearly demonstrated by an exhibition given by Miss M. E. Finley, of New York City, who in a severe test, rapidly and accurately transcribed on the Smith Premier Typewriter a difficult article on physiology, dictated to the phonograph. This machine combines three features not found in other typewriters: First, the ease with which the work is examined; second, the type-cleaning brush, by which the characters are rapidly cleaned; third, the locking of the keys at the end of the line, thereby preventing the doubling of letters and unsightly errors.

## The Meisterschaft System Taught by the Phonograph.

THE COLUMBIA PHONOGRAPH CO. OF MARYLAND, DELAWARE, AND THE DISTRICT OF COLUMBIA.

627 E ST., N. W., WASHINGTON, D. C.,
January 19, 1891.

*To the Editor of The Phonogram:*

You deserve congratulation. The first issue shows peculiar phonographic intelligence and enterprise. We have sent copies to all of our subscribers.

The local companies should profit by your editorial warning not to lose sight of the commercial field while operating coin-slot phonographs. The coin-slot branch should be carefully managed; only the best records put on machines, which should always be in perfect order. Nevertheless, managers should not forget that the practical office and home use of the phonograph can only be developed by untiring effort, and is the permanent part of the business.

Our latest new work in Washington is language-teaching. Dr. Richard S. Rosenthal, the well-known author of the Meisterschaft system, has come here to work with the Columbia Company. He has already given two free lectures on the subject, at one of which phonographs with language lessons upon them were shown. A number of students are already engaged in this, the ideal way of mastering a foreign language. Pupils are furnished with books and prepared cylinders to match. The method of study is to train eye and ear at the same time. A pupil with his lesson on the cylinder can, by hearing it over and over again, master the pronunciation perfectly; while his eye at the same time follows the printed text and he learns how the words look and are spelled.

To a person who has a phonograph, we furnish a set of books with cylinders to match, (about fifty) covering a year's course for $50.00. Classes of not less than ten are equipped with a phonograph for a year, ten sets of books and one set of cylinders with ten-way hearing-tube, for $30.00 each.

This use of the phonograph has been presented in literature for a long time, but has not before been taken up practically and earnestly.

The demands on our musical department are so great that we are constantly enlarging it. As this is the only company having access to the President's band, we are kept very busy filling orders which come from all parts of the country.

Our commercial business is making rapid gains. Since your last issue we have increased the number of machines in the United States Senate, the Census Office and the National Museum, while the private list has been largely augmented.

I enclose clipping from the *Evening Star* of January 17, relative to the use of the phonograph in armories for drilling purposes. Experiments are also being made with a view to the use of the machine in connection with calisthenics.

We have many applications for the purchase outright of machines, and believe the selling policy will help materially.

Our Baltimore office is full of business, and reports constantly increasing interest in the phonograph for the office and the home. We have begun language-teaching there also.

EDWARD D. EASTON,
*President.*

## The Phonograph Abroad.

THE Automatic Phonograph is proving profitable to those interested in this application of the invention. The effort to push the instrument in South America was, at last accounts, far from successful. Now and then, some one has a story to tell illustrating the curious properties of the instrument. One large importing house has a phonograph that speaks half a dozen languages. It is whispered that a large concern interested in the manufacture of the instruments took to using them in the place of stenographers only after some one had pointed out the inconsistency of any other course.

# Business Suggestions.

* * * In many of the batteries in use at the present time the *high internal resistance* causes expenditure of current; *local action*, resulting in the waste of material and curtailment of the life of the cell; and *polarization* which reduces the E. M. F. to such an extent as to render these batteries incapable of furnishing sufficient current to do the work, especially if kept on closed circuit for any length of time.

In producing a perfect galvanic cell, the aim is to secure low internal resistance and constancy of E. M. F. (or in other words absence of local action and polarization). The *Edison-Lalande Battery* has a type of galvanic cell which meets all requirements, and is suited to every class of work.

The Edison-Lalande cell is a modification, or rather a development of the battery invented some years ago by Messrs. De Lalande & Chaperon. The Lalande-Chaperon cell attracted considerable attention at the time of its appearance, on account of its comparative simplicity, its low internal resistance and constancy of action. In the *Edison-Lalande* the loss by local action is less than one-half of one per cent., and the internal resistance of the 300 ampere-hour cell is *only .025 of an ohm*. When we come to consider that the majority of batteries now in use have an internal resistance varying from 1 to 5 ohms, the great gain in this respect is at once apparent, it being obvious that the internal resistance of the *Edison-Lalande* cell is *forty times* less than that of its competitor.

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* * * With the increase of type-writing machines the New York Carbon and Transfer Paper Co. have kept pace with the demand for Carbon Papers and Ribbons of a fine grade and quality, and have also established agencies in the principal cities of the United States and Canada. The goods manufactured and sold are guaranteed to be equal to any in the market Ribbons of extra length, and all supplies for the typewriter may be obtained at the shortest notice. * * *

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* * * Among the many houses in this city engaged in the business of reproducing by electricity and photography plates for printing purposes, is the "Art-Photo Etching Co.," located in the Raub Building, corner Fulton and Nassau Sts., this city, of which Messrs. Ladd & Sheldon are the active partners. This company is rapidly coming to the front, and has a reputation for furnishing fine work at very reasonable rates. * * *

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* * * We are reaching a period in the development of electricity when every fact developed and every thought contributed for publication is awaited with the keenest interest.

The newspapers of the day are coming to recognize the wonderful changes resulting from discovery and invention in the arts and sciences, so that they freely give entire departments to this important subject.

In order, however, to obtain a consensus of that which is most important, we cannot do better than recommend to our readers the *Electrical World*. * * *

# Authors and Publishers.

In this department we give short reviews of such *New Books* as publishers may send us. We invite publishers to favor us with their recent publications, especially such as are related to Electricity theoretical or applied.

*A Dictionary of Electrical Words, Terms, and Phrases*, by Edwin J. Houston, A. M.; 656 pages, 397 illustrations; cloth binding. Price, postage prepaid to any part of the world, $2.50. The W. J. Johnston Co., Ld., Times Building, New York. 1889.

It rarely happens that a demand is so entirely and satisfactorily supplied, as is the case by the timely issue of Prof. Houston's Electrical Dictionary. It is a book that ought to find a place on the reference shelf of every professional man, whether he be lawyer, editor, physician, teacher, or simply a person of general culture. The applications of electricity have become so widespread, and are being so rapidly extended into every department of daily life, that in order to understand the constant allusions of the daily and periodical press to these conditions, such a book of reference is a necessity. The literary part is clear and concise, while the illustrations leave nothing to be desired. In a word, it has no rival.

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The *A. B. C. of Electricity* is a practical handbook of value to all interested in the application of Electrical work. It combines in small space special information on the different branches of the science, and is endorsed by Mr. Thomas A. Edison. Published by the J. W. Lovell Co.

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We call the attention of our readers that we have made a special arrangement with the *Cosmopolitan Magazine*, by which they can obtain both the Phonogram and the *Cosmopolitan* for $2.40, the price of the larger magazine alone. To any one forwarding their name and address before January 1, 1892, to this office, sample copies will be sent.

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If those who have in contemplation the introduction of "Electrical Appliances" would consult an experienced man who is fully informed as to the many systems and apparatus now in use in connection with the telegraph, the telephone, the arc and incandescent electric light, the messenger call, fire alarm, etc., much time and money would be saved. So rapidly have new ideas been developed, that it is an utter impossibility (without giving much time and thought to the subject), to decide without the aid of an expert. Such a man is Mr. William J. Hammer, of Temple Court, New York, who had charge of the Edison Display at the Paris Exposition, and who has published a handsomely illustrated book, which gives an idea of the scope and beauty of the exhibit. Mr. Hammer has had a very large experience as consulting and supervising engineer, and the special endorsement of him by Mr. Thomas A. Edison, sustains his reputation, and the high opinion in which his judgment on electrical matters is regarded by the press and many prominent electricians.

# WHAT THE PEOPLE SAY.

## TESTIMONIAL LETTERS FROM OFFICERS OF THE PHONOGRAPH COMPANIES OF THE UNITED STATES.

IN ORDER TO SHOW THE CHARACTER OF THE WELCOME ACCORDED TO "THE PHONOGRAM," WE PRESENT THE FOLLOWING EXTRACTS FROM SOME OF THE MANY HUNDRED LETTERS RECEIVED SINCE THE ISSUE OF THE FIRST NUMBER.

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FROM LABORATORY OF THOMAS A. EDISON,
ORANGE, N. J., January 2, 1891.

I have received the first number of THE PHONOGRAM, which you kindly sent to me, and I am very much pleased with it. From both a literary and typographical point of view the magazine is excellent, and you have my best wishes for its future success. Mr. Edison wishes five copies sent him monthly.

Yours very truly,
A. O. TATE,
Private Secretary to Thomas A. Edison.

---

NEW YORK, January 19, 1891.

I have read the magazine, and was very much pleased with it. I think it will be a great success.

Very truly,
T. R. LOMBARD,
Vice-Pres't of N. A. Phonograph Co.

---

NEW YORK, December 8, 1890.

I wish your paper, THE PHONOGRAM, the greatest success. Yours very truly,
ROBERT G. INGERSOLL.

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NEW YORK, December 28, 1890.

It is with pleasure I acknowledge the receipt of THE PHONOGRAM this morning. I have looked it over, or, shall I say, ground out the cylinder. The publication is very spicy, popularly scientific, etc.

Very truly yours,
A. D. VANCE,
American Telephone Co.

---

BUFFALO, N. Y., Jan. 21, 1891.

We are all much pleased with the paper here in the office, and will be glad to see the next number. Yours truly,
H. D. PULSIFER,
New York Phonograph Co.

---

ST. LOUIS, January 9, 1891.

We are certainly very highly pleased with the general make-up of THE PHONOGRAM, and we wish you to send one hundred more copies of the next issue. Very truly yours,
J. C. WOOD,
Gen. Manager of Missouri Phonograph Co.

---

JACKSONVILLE, FLA., January 3, 1891.

I was much pleased with the first copy of THE PHONOGRAM, and feel certain that it will be of immense advantage to the phonograph interests.

I will do all I can for the success of the magazine. Yours truly,
T. F. GAINES,
Supt. of Florida Phonograph Co.

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PITTSBURGH, PA., January 19, 1891.

We think THE PHONOGRAM is a good idea, and are desirous of seeing it succeed; and will do everything in our power to help it along.

Yours truly,
HENRY F. GILG,
Sec'y of Western Penn. Phonograph Co.

---

BOSTON, January 6, 1891.

We shall certainly look with pleasure to the publication of THE PHONOGRAM, and read it with interest. Yours truly,
AUG. N. SAMPSON,
Gen. Manager of New England Phonograph Co.

---

GALVESTON, TEXAS, January 2, 1891.

We have received THE PHONOGRAM, and beg leave to congratulate you upon its appearance. We think it will prove very useful in our work.

Yours truly,
THOS. CONYNGTON,
Business Mgr. of Texas Phonograph Co.

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NEW YORK, January 5, 1891.

I shall be happy to do all in my power to advance the interests of THE PHONOGRAM.

Yours very truly,
RICHARD T. HAINES,
Sec'y N. Y. Phonograph Co.

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ATLANTA, GA., January 17, 1891.

The general idea of your PHONOGRAM is excellent, and we believe it should have the hearty and unanimous support of all the Phonograph companies throughout the United States, and should receive encouragement from all who are interested in the phonograph in any way.

Very truly,
F. E. CLARKSON,
Supt. of Georgia Phonograph Co.

# SPLENDID TRIBUTES TO THE PHONOGRAPH.

## VOICED BY THE PRACTICAL MEN OF AMERICA.

### AFTER THESE WHO CAN DOUBT?

MR. JESSE LIPPINCOTT—*My Dear Friend:*

I am glad to say to you that I have practically tested the application of the phonograph to the linotype, and conceive that it will be an important combination. I can think of nothing more enterprising than to see a reporter rushing in suddenly with a very important item at the last minute before the paper goes to press, telling the story of the phonograph, and having it immediately transferred to type a great deal quicker than he could think of writing it, much less having it composed, justified, proved and made ready for the press. It is a new day that dawns for the phonograph, for typography and for the world at large.

ERASTUS WIMAN.

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(Copy)

ST. LOUIS, Jan. 5, 1891.

THE MISSOURI PHONOGRAPH CO., ST. LOUIS, MO.

*Gentlemen:*

Herewith I inclose my check in payment of bill for rent of battery for second quarter ending March 31st, 1891.

The best recommendation that I can give the phonograph is to say to you that I want another of them to assist me in getting through with my work. I will therefore ask you to deliver me another complete outfit similar to the one which I have. Bring it to my house.

I shall want at least five dozen cylinders with the machine, and table; also some cases of which we will give you information when you call.

Yours very truly, SEYMOUR D. THOMPSON.

---

HOUSE OF REPRESENTATIVES,
WASHINGTON, D. C., Oct. 1, 1890.

MR. E. D. EASTON, PRESIDENT OF COLUMBIA PHONOGRAPH COMPANY.

*Dear Sir:*

The session of Congress now being over, I wish to return my graphophone, rented from your company the latter part of last November. In doing so I wish to say that I have found this machine of much value indisposing of my large correspondence; that my clerk, who is not a stenographer, but uses the typewriter, transcribes my dictation accurately and readily; and that from point of convenience and time and money-saving, the new method is a decided improvement over the shorthand amanuensis in many respects.

On my return to Washington at the beginning of the next session I hope to again use the machine. Yours truly, J. A. PICKLER.

---

W. M. MCCORMICK,
WHOLESALE WHITE PINE & HEMLOCK LUMBER.
GIRARD BUILDING, BROAD and CHESTNUT STS.,
PHILADELPHIA, April 22, 1890.

EASTERN PENNA. PHONOGRAPH CO.

*Gentlemen:*

I have used your phonograph since June 1st, and it gives it entire satisfaction. It answers every purpose of a stenographer, and I have every reason to believe that it will come into general use in business offices. Yours truly,

W. M. MCCORMICK.

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THE CARRIAGE MONTHLY,
WARE BROS., PUBLISHERS.
1113 MARKET ST., P. O. BOX 2769.
PHILADELPHIA, April 4th, 1890.

EASTERN PENNSYLVANIA PHONOGRAPH CO., PHILA.

*Dear Sirs:*

We note we have been using the Edison phonograph one month to-day; that during this period the writer dictated to one instrument eleven hundred and sixty-eight (1168) letters, all of which were transcribed correctly by the lady typewriter from the second machine in her charge.

The success we have had with our first month's service with the phonograph is conclusive to us, for our business, it is proving most satisfactory. With best wishes, we are,

Yours truly, WARE BROS.

---

LEDGERWOOD MFG. CO., 96 LIBERTY ST., CITY.
NEW YORK, March 4, 1890.

N. Y. PHONO. CO., 257 5TH AVE., N. Y.

*Gentlemen:*

Since writing you on the 21st of November last, we have been using two of your new machines in our office, which we find perfectly satisfactory in every particular, and, as you are aware, the writer recently ordered one for use at his house, which has been in operation for several weeks now and works exceedingly well.

We are so well satisfied with your machine that we desire to repeat our statement made to you as to their excellent performance and the great saving they are in our office. We would not be without them under any consideration whatever.

While we have a competent stenographer in the office, the writer has not used him for dictation since the machines were first put in, every letter that has been sent out being dictated to the phonograph.

We find the machine such a great convenience and of such value, that we are not only willing but desirous of recommending it to others, and would say in this connection that we have induced a number of our friends to put in the machine, and they have found it equally as satisfactory as ourselves. We are, yours very truly,

(Signed) LEDGERWOOD M'FG. CO.

Dictated to phonograph by W. L. Pierce, Secy.

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(Copy)

GUS. V. BRECHT BUTCHERS' SUPPLY CO.
OFFICE AND FACTORY, 1201 TO 1211 CASS AVE.
ST. LOUIS, Nov. 13, 1890.

MISSOURI PHONOGRAPH CO., CITY.

*Gentlemen:*

After giving your two improved Edison phonographs a thorough trial for a month, we find them to be a great convenience; in fact, we consider them an indispensable piece of office furniture and would not be without them. Our typewriter transcribed 1,600 letters the first month, which was about one-third more than with the old system.

We can highly recommend it to any one having a great deal of correspondence, and as stated already, we would not be without it any more, which thoroughly expresses the satisfaction which they are giving. Yours truly,

GUS. V. BRECHT BUTCHERS' SUPPLY CO.

THE **EDISON**

## MIMEOGRAPH.

Patented by THOS. A. EDISON.

A simple, practical, and economical manifolding device for every-day use.

It makes 3,000 copies of one original Writing, Drawing, Music, etc. 1,500 copies of one original Typewriter Letter. Recommended by over 40,000 users Send for circular and sample of work.

**A. B. DICK COMPANY,**

32 Liberty Street, NEW YORK. 152-154 Lake Street, CHICAGO.

117 South 5th Street, PHILADELPHIA.

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# SILK For Electrical Purposes.

SILK FOR INSULATING FINEST WIRE.

ALL KINDS BRAIDING SILK.

WILLIAM RYLE & CO., 54 Howard St., New York City.

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SAVE EVERY BUSINESS AND PROFESSION, labor and money, by keeping account of each transaction for future reference.

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---

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SUPPLIED ALL SHAPES.

SCRAPS BOUGHT.

CHAS. S. PLATT,

29 and 31 Cold St., N. Y.

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## $2.40 + $1.00 = $2.40.

# LOOKS QUEER,

THE PHONOGRAM COSMOPOLITAN MAGAZINE

*But it's all right. No error in our arithmetic. We explain above problem thus: THE COSMOPOLITAN MAGAZINE costs $2.40 a year; THE PHONOGRAM costs $1.00; the two together would ordinarily cost $3.40. We will send both publications, however—and they are the very best of their high class—for a whole year for the price of the magazine alone—**$2.40**. You will never get a like opportunity again. It's a chance to be caught before it flies away with time. You know all about THE PHONOGRAM, and if you're not familiar with THE COSMOPOLITAN, send to the publishers for a free sample copy, addressing THE COSMOPOLITAN MAGAZINE, Madison Square, New York City.*

*THE PHONOGRAM will be sent to one address and THE COSMOPOLITAN to another if you like. Send all orders to*

THE PHONOGRAM,

ROOM 127, PULITZER BUILDING, NEW YORK.

## BOTH FOR $2.40 A YEAR.

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# AMERICAN

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# AGENTS WANTED.

*A GREAT WORK,*

# JEFFERSON DAVIS,

Ex-President of Confederate States.

# A MEMOIR,

BY HIS WIFE.

## SUPERBLY ILLUSTRATED.

**Cloth, $5.00; English Grained Cloth, $6.50; Half Morocco, $7.50; Half Russia, $8.50; Full Morocco, $12.00.**

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**18 and 22 East 18th St., New York.**

# HOW TO FILE LETTERS

THERE are only two methods for filing letters and office papers, one which our forefathers used and many of the present generation are still using with all its inconvenience, that is, to fold back and pigeonhole them. The other, which represents the progress of the age, is the simple system used in the

## AMBERG CABINET LETTER FILE,

which requires no folding or endorsing, the mere act of placing the letter away files it, and the reference at any time in the future is immediate. If you are interested, send for an Illustrated Catalogue and Price-List which is thoroughly explanatory.

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CHICAGO. LONDON.

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